

One-Month Ketogenic Check-up for Bertrand Thomas Might

PARENTS' AGENDA

- Summary
- Seizure Patterns
- Charts & Graphs
- Calories v. Fluids
- Weight & Height
- Schedule & Sleepiness
- Additional Supplements: Piracetam and Vitamin B6
- Additional Testing: Vitamin D, PTT, Albumin, Glucose monitor
- Constipation: Miralax
- Recipe Substitutions

SUMMARY

Bertrand had Roseola for the first two weeks of the diet. This posed a hurdle to hydration and calorie intake. Now that he is well, positive patterns are emerging. Increased concentration and tracking. Displays object permanence and emotion.

SEIZURE PATTERNS

Observable SZ patterns emerged: during bottle sucking, just after bottle, during yawn, when tired. Early morning SZ most common. Possible remedies: decreasing night span w/out food or increasing ratio for last meal?

CHARTS & GRAPHS

| Date | Ketones | Calories | Fluid | Startles | Drops | Health | BM | Notes |
|--------------|---------|----------|-------|----------|-------|--------|-----|-------------------------|
| Nov 25, 2009 | 2 | 1398 | 1,323 | 20 | 0 | Sick | No | Eggnog |
| Nov 26, 2009 | 2 | 1398 | 1,120 | 15 | 1 | Sick | No | Eggnog |
| Nov 27, 2009 | 2 | 1120 | 800 | 15 | 0 | Sick | No | Eggnog & Benadryl |
| Nov 28, 2009 | 2 | 868 | 590 | 15 | 0 | Sick | Yes | KetoCal & Benadryl |
| Nov 29, 2009 | 2.5 | 762 | 885 | 13 | 1 | Sick | No | KetoCal & Benadryl |
| Nov 30, 2009 | 3 | 539.5 | 495 | 13 | 0 | Sick | No | Airplane travel & juice |
| Dec 1, 2009 | 2.5 | 693 | 795 | 5 | 0 | Sick | No | More verbal. |
| Dec 2, 2009 | 2.5 | 653 | 810 | 4 | 0 | Sick | No | Great demeanor. |
| Dec 3, 2009 | 2 | 783 | 920 | 12 | 1 | Sick | No | Powerade Zero. |
| Dec 4, 2009 | 2 | 1001 | 1,150 | 8 | 0 | Well | No | |
| Dec 5, 2009 | 2 | 791 | 1,000 | 8 | 0 | Well | Yes | Sleepy. |
| Dec 6, 2009 | 2.5 | 927 | 1,090 | 5 | 1 | Well | Yes | Sleepy. |
| Dec 7, 2009 | 2 | 778 | 930 | 12 | 5 | Well | Yes | Blood draw. |
| Dec 8, 2009 | 2 | 794 | 1,045 | 1 | 1 | Well | Yes | Sleepy. |
| Dec 9, 2009 | 2 | 608 | 800 | 10 | 2 | Well | No | Too much saccharin |
| Dec 10, 2009 | 2.5 | 743 | 940 | 4 | 1 | Shots | No | Sleepy. |
| Dec 11, 2009 | 2 | 778 | 960 | 3 | 4 | Well | No | Missed PM Keppra. |
| Dec 12, 2009 | 3 | 543 | 670 | 3 | 1 | Sick | No | |
| Dec 13, 2009 | 3 | 871 | 1,075 | 1 | 0 | Sick | Yes | Sleepy. |

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CALORIES V. FLUIDS

Bertrand was not finishing bottles and rejecting the KetoCal in a "I am full" manner. On December 4th, calories were decreased to see if that would increase fluid intake. It appears to have worked.

WEIGHT & HEIGHT

Bertrand's height is stable and weight (taken every Tues. at 9am) is staying at 28.0 lbs.

SCHEDULE & SLEEPINESS

Bertrand's schedule is shot. He is sleepy all the time. Is the Kepra dose too high?

ADDITIONAL SUPPLEMENTS

PIRACETAM

Piracetam (sold under many brand names) is a nootropic drug. It appears to enhance cognition and memory, slow brain aging, increase blood flow and oxygen to the brain, aid stroke recovery, and ameliorate Alzheimer's, Down's syndrome, dementia, and dyslexia, among other diseases and conditions. Piracetam's chemical name is 2-oxo-1-pyrrolidine acetamide; it shares the same 2-oxo-pyrrolidone base structure with 2-oxo-pyrrolidine carboxylic acid (pyroglutamate). Piracetam is a cyclic derivative of GABA. It is one of the racetams. Piracetam is prescribed by doctors for some conditions, mainly myoclonus,[1] but is used off-label for a much wider range of applications.

VITAMIN B6

Chang Gung Med J. 2007 Sep-Oct;30(5):396-401.

Vitamin B6 related epilepsy during childhood.

Wang HS, Kuo MF.

Division of Pediatric Neurology, Chang Gung Children's Hospital, Taipei, Chang Gung University College of Medicine, Taoyuan, Taiwan. wanghs444@cgmh.org.tw

In some patients without vitamin B6 deficiency, epilepsy can not be controlled without an extra supplement of vitamin B6. The therapeutic role of pyridoxal phosphate (PLP), the active form of vitamin B6, may not be replaced with other forms of vitamin B6 sometimes. Until now, four inborn errors of metabolism are known to affect vitamin B6 concentrations in the brain. Three of them are hyperprolinemia type 2, antiquitin deficiency, and pyridoxine phosphate oxidase deficiency. The fourth disorder occurs in neonates with hypophosphatasia and congenital rickets. All patients with these conditions present with early-onset epilepsy that is resistant to conventional antiepileptic medications. Patients with three of the conditions respond to any form of vitamin B6. Only those with pyridoxine phosphate oxidase deficiency respond to PLP instead of pyridoxine. *Interestingly, the authors have successfully treated many patients without the above four disorders using vitamin B6, and have found that the treatment was more effective with PLP than with pyridoxine, though the mechanism is not known. Since PLP is as inexpensive as pyridoxine, we suggest replacing PLP for pyridoxine when treating children with epilepsy.*

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ADDITIONAL TESTING

Keppra levels

Vitamin D

PTT, Albumin (as per Dr. Samson-Fang for more accurate liver function)

Glucose monitor at home?

CONSTIPATION

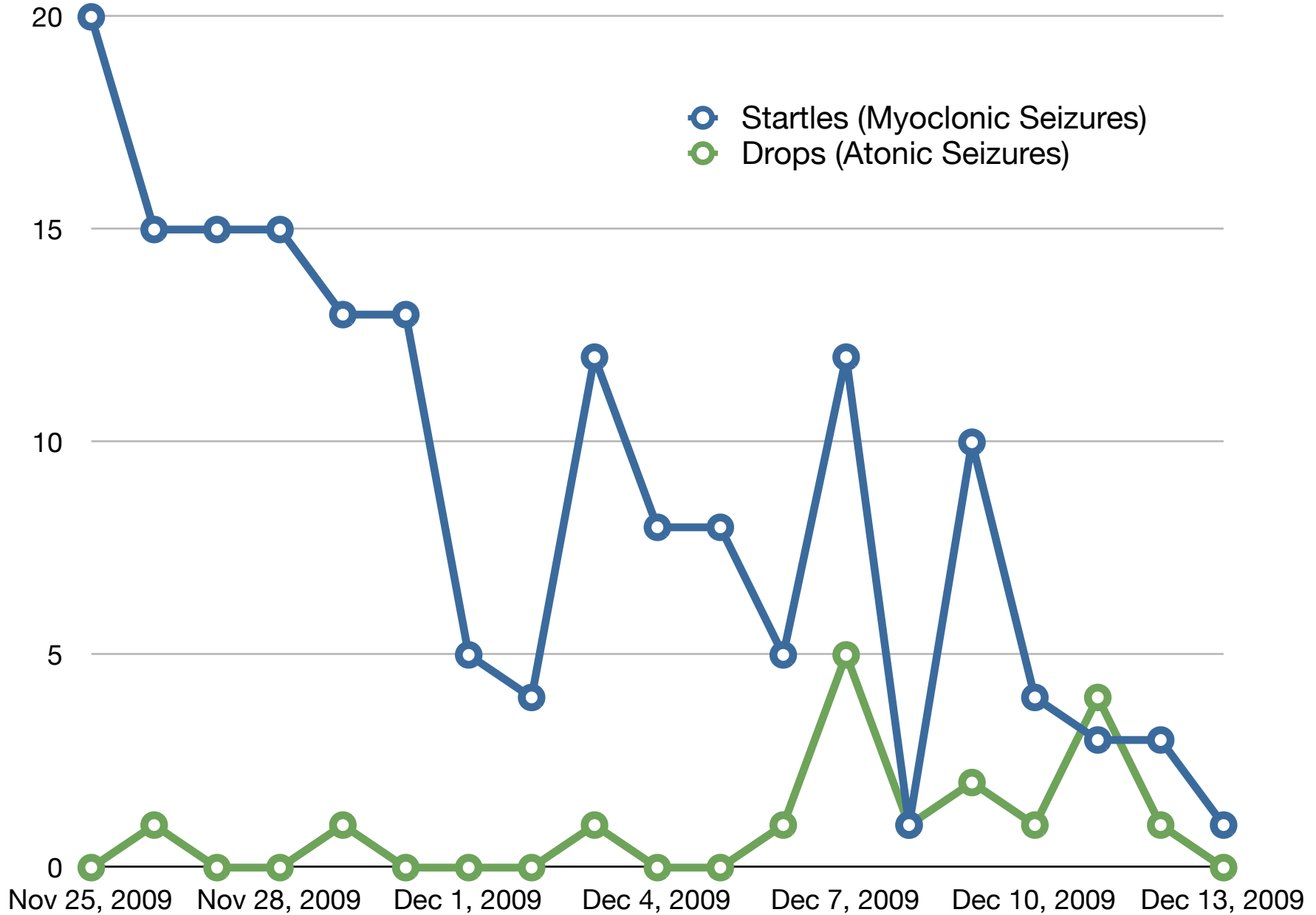
What is a safe and effective daily Miralax dose?

RECIPE SUBSTITUTIONS

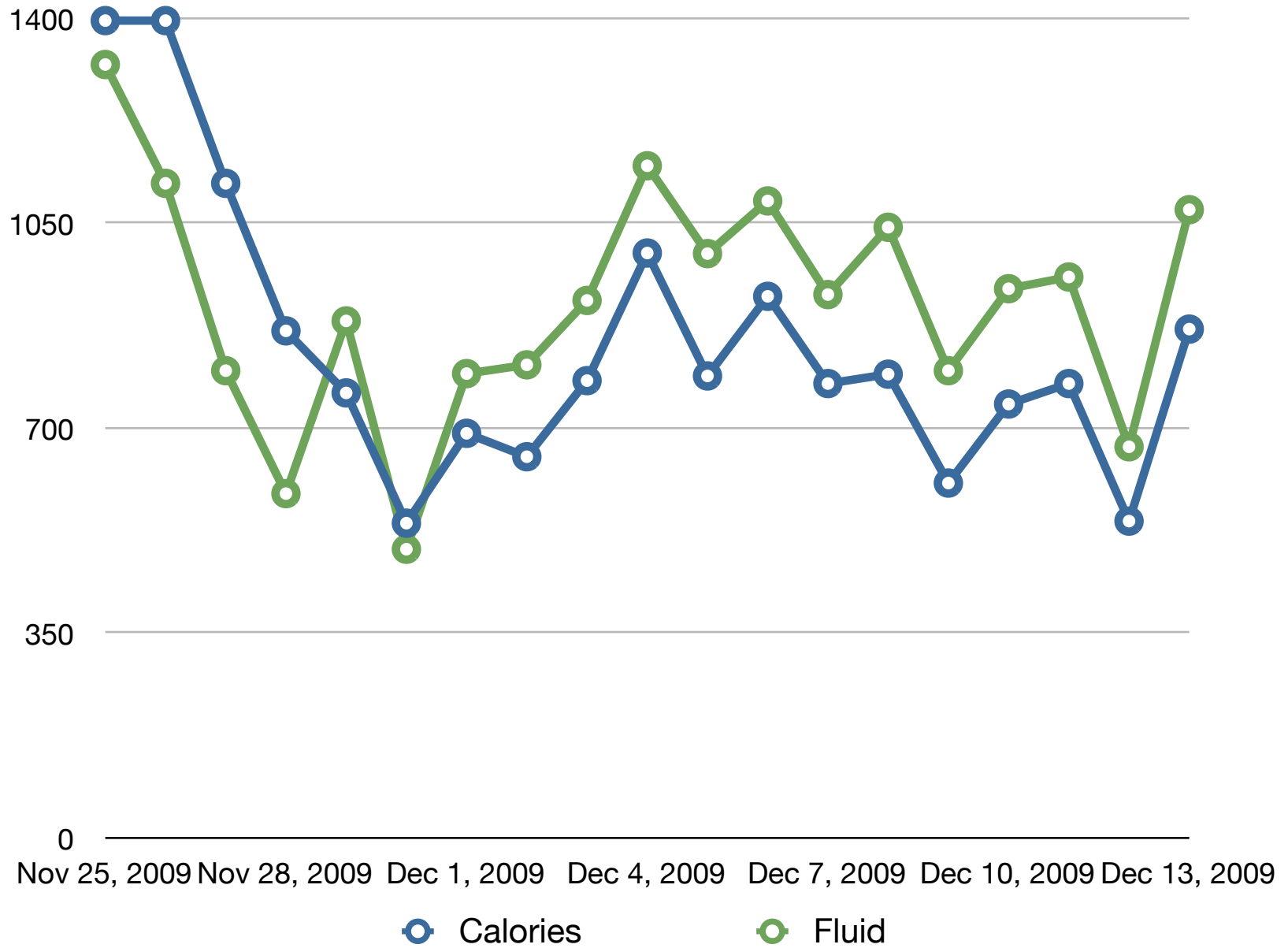
CarbMaster Yogurt for Dannon Carb Control.

KetoVolve for KetoCal. This is a new keto formula with no transfat and formulated with MCT oil. There is decreased constipation with this product. Initial reviews say that the taste and consistency are superior to KetoCal.

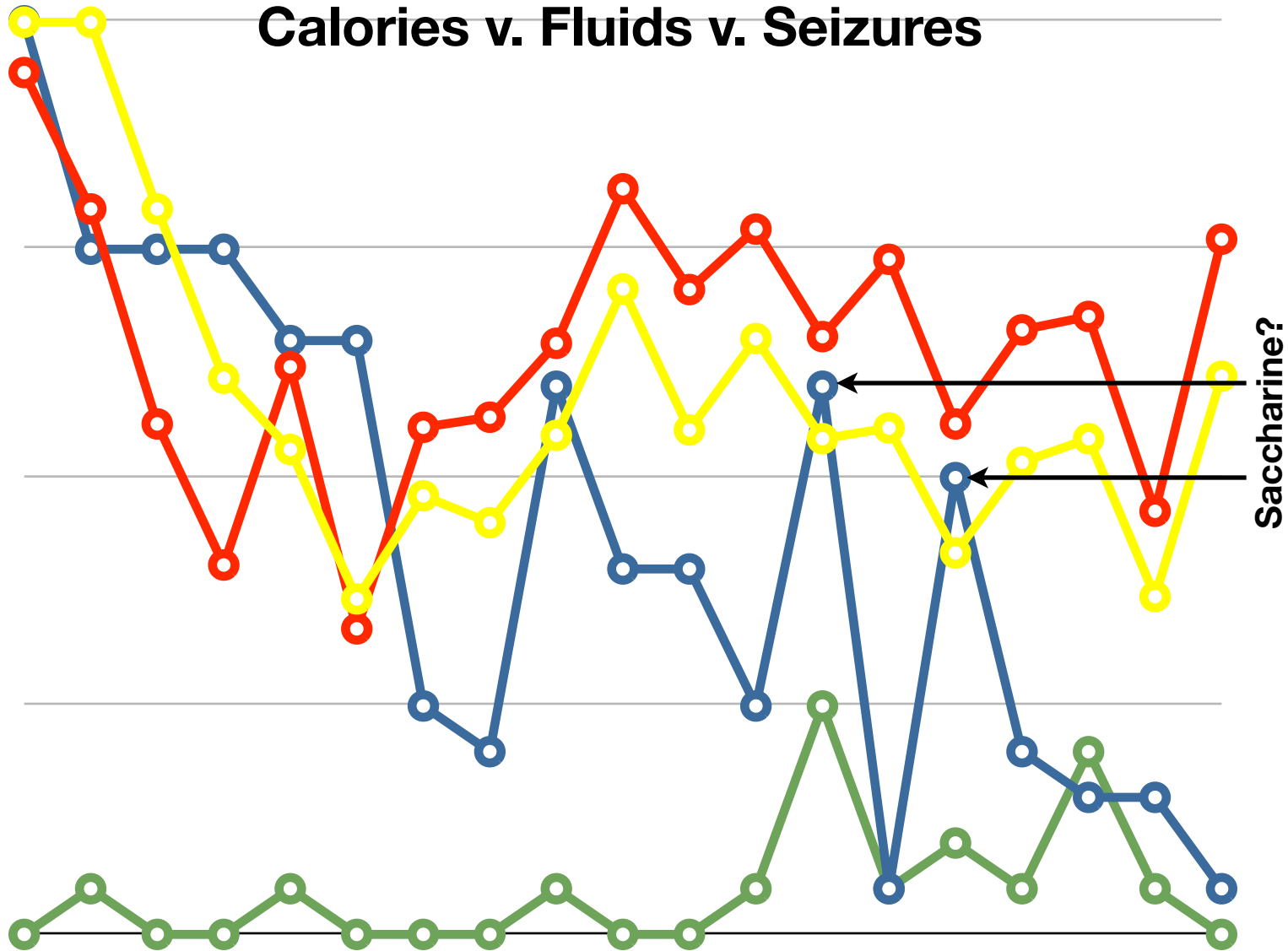
Number of Seizures (Myoclonic & Atonic)



Amounts of Calories & Fluid



Calories v. Fluids v. Seizures



- Calories
- Fluid
- Myoclonic Seizures
- Atonic Seizures

KetoVOLVE™

4:1 Ratio Powder

Managing the ketogenic diet – *EFFECTIVELY* | *EASILY* | *SAFELY*

A Medical Food for the dietary management of intractable epilepsy.

Advantages

- Nutritionally complete for children 1-8 years
- 100% whey protein
- Trans fat free
- Medium chain triglycerides (MCT) – more ketogenic than LCTs, fast acting, provides laxative effect²
- Lactose free
- Micronutrient dense (see table 1)
- Meets Vitamin D requirements of 400 IU (10 ug) per day
- Sweetened with Sucralose®
- Easy to prepare – easily dissolves in warm water

Superior Protein Source

- Highest possible protein rating score – *PDCAAS of 1.0
- Excellent amino acid profile
- Protein requirements met with low energy intake (see table 2)
- Lactose free
- GMO free

*The protein digestibility corrected amino acid score (PDCAAS) has been adopted by the FDA and FAO/WHO as the preferred method for the measurement of the protein value in human nutrition.¹

90% Fat with a Healthier Fat Profile (see chart 1)

- Trans fat free
- 25% of fat as MCT
- Contains a blend of polyunsaturated, monounsaturated and saturated fat
- GMO free

Products designed by healthcare professionals

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NUTRITION

Nutrition Information

| Nutrients | per 100 g powder |
|--------------------------------|---------------------------------|
| Energy | 712 |
| % Protein | 8.7 |
| % Fat | 89.2 |
| % Carbohydrate | 2.1 |
| Protein Source | 100% Whey |
| Protein, g | 14.5 |
| Fat, g | 73.64 |
| Trans, g | 0 |
| % MCT | 25 |
| % LCT | 75 |
| Carbohydrate, g | 3.8 |
| Lactose, g | 0 |
| Vitamins | |
| Vitamin A, ug RE | 400 |
| Vitamin D, ug | 10 |
| Vitamin E, mg TE | 7 |
| Vitamin K, ug | 55 |
| Vitamin C, mg | 25 |
| Thiamine, mg | 0.6 |
| Riboflavin, mg | 0.6 |
| Vitamin B ₆ , mg | 0.6 |
| Vitamin B ₁₂ , ug | 1.2 |
| Niacin, mg | 6.7 |
| Folic Acid, ug | 200 |
| Pantothenic Acid, mg | 3 |
| Biotin, ug | 12 |
| Choline, mg | 250 |
| Inositol, mg | 58 |
| Minerals | |
| Calcium, mg | 800 |
| Phosphorous, mg | 695 |
| Magnesium, mg | 130 |
| Iron, mg | 10 |
| Zinc, mg | 4.7 |
| Manganese, mg | 1.4 |
| Copper, mg | 440 |
| Iodine, ug | 90 |
| Selenium, ug | 30 |
| Chromium, ug | 15 |
| Molybdenum, ug | 22 |
| Sodium, mg | 309 |
| Potassium, mg | 889 |
| Chloride, mg | 723 |
| Standard Dilution kcal / mL | 1 g powder : 4 mL water 1.45 |

Meeting Micronutrient Requirements

Table 1

| Age (years) | Amount of KetoVOLVE needed to meet ≥ 100% of the DRI for all micronutrients (excluding electrolytes) | Amount of KetoVOLVE needed to meet ≥ 90% of the DRI for all micronutrients (excluding electrolytes) | Amount of KetoVOLVE needed to meet ≥ 80% of the DRI for all micronutrients (excluding electrolytes) |
|-------------|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| 1-3 | 100 g (712 kcal) | 90 g (641 kcal) | 80 g (570 kcal) |
| 4-8 | 120 g (854 kcal) | 108 g (769 kcal) | 96 g (683 kcal) |

Meeting Protein Requirements

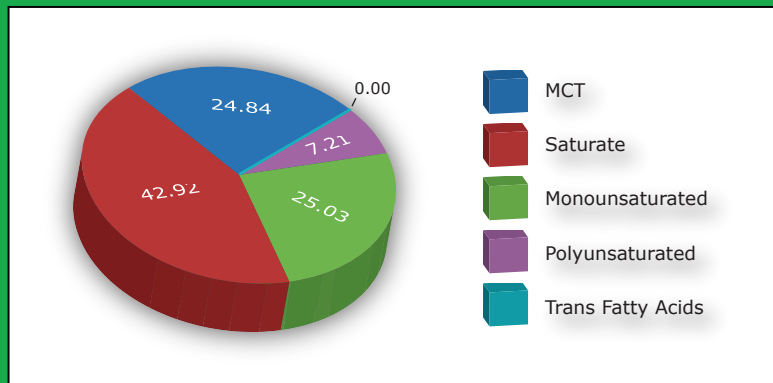
Table 2

| Age (years) | †Daily DRI for Protein (g) | Amount of KetoVOLVE to meet daily needs | Energy from KetoVOLVE (kcal) | Patient example |
|-------------|----------------------------|-----------------------------------------|------------------------------|--------------------------------------|
| 1-3 | 13 | 90 g | 641 | 12 m ♀ @ 8 kg (5%) = 1.6 g/kg/d |
| 4-8 | 19 | 130 g | 925 | 5 yo ♂ @ 17 kg (25%) = 1.1 g/kg/d |

† Dietary Reference Intakes: Macronutrients, www.nap.edu

Fatty Acid Distribution

Chart 1



References

1. Gertjan Schaafsma, The Protein Digestibility–Corrected Amino Acid Score; *Journal of Nutrition*. 2000;130:1865S-1867S.
2. Nicole Edwards, The MCT Diet, *Keto News*: 2007; www.epilepsy.com.

Sucralose® is a trademark of McNeil Nutritionals, LLC.
KetoVOLVE® is a trademark of Essentials Inc.

